Attorney's Docket No. 004501-446

AF/ 2121

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	
Otto Preiss et al.	Group Art Unit: 2121
Application No.: 09/698,234	Examiner: CRYSTAL J BARNES
Filed: October 30, 2000	Appeal No.:
For: INTEGRATION OF A FIELD DEVICE IN AN INSTALLATION CONTROL SYSTEM	

APPEAL BRIEF

Mail Stop APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated January 21, 2004 (Paper No. 12), finally rejecting claims 2-9, 11 and 14-24, which are reproduced as the Claims Appendix of this brief.

☒ A check covering the ☐ $250.00 (2402) ☒ $500.00 (1402) Government fee is filed herewith.

☐ Charge ☐ $250.00 (2402) ☐ $500.00 (1402) to Credit Card. Form PTO-2038 is attached.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

12/21/2004 HGUTEMA1 00000044 09698234
01 FC:1402 500.00 OP

Table of Contents

I. Real Party in Interest

The present application is assigned to ABB Research Ltd.

II. Related Appeals and Interferences

The Appellants' legal representative, or assignee, does not know of any other appeal, interferences or judicial proceedings which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

The claims currently pending in this application are claims 2-9, 11 and 14-24, all of which stand finally rejected. Claims 1, 10, 12 and 13 were previously canceled. Claims 2-9, 11 and 14-24 are being appealed.

IV. Status of Amendments

No amendment was filed after final rejection.

V. Summary of Claimed Subject Matter

The present invention is generally directed to a method and system for integration of a field device in an installation control system, such as a high-voltage or medium voltage substation controlled by a distributed installation control system of field devices interconnected by communications links. Exemplary embodiments include a substation or switch gear assembly controlled by a distributed installation control system from field devices connected to one another via a number of communications buses. An exemplary method or control system as claimed is adapted for integration of a new field device into the control system. That is, exemplary embodiments are directed to the adding of a field device to the control system by connecting it to a communications network represented by the

communication buses, such as the communications buses 3 and 5 of Appellants' Figure 1.

As described on Appellants' specification page 8 beginning with line 17, a control station, such as control station 2 of the Figure 2 installation control system, includes an engineering application 21 for integration of field devices 1 and for commissioning of the installation. As described on Appellants' specification page 17 beginning with line 15, during operation of the installation, following the integration, the engineering application is no longer required.

In accordance with exemplary embodiments, the integration of a field device in a control system is performed by a process which includes transmitting, from the field device to the control station, a functional description of the field device in a standardized form. Appellants' specification pages 9-10 provide an exemplary functional description as a "Substation Configuration Language (SCL)." The content of the functional description, including addresses, type of device functions, and so forth, enables the installing of functions associated with the field device on the control station, and the configuring of communications links between the field device functions and the control station functions. Transmission of the functional description can be performed without a communication link having been set up before hand, but rather can be based on a registry service as described, for example, on Appellants' specification page 8, beginning with line 34.

Following transmission of the functional description from the field device, functions associated with the field device can be installed on the control station. This installing function can be performed by the engineering application, which instantiates (that is, creates and assigns) associated functions, such as graphical representations, at the control station. The installing function is described, for example, at specification age 12, beginning with line 31.

Communication links are configured between the device functions and the control station functions. The communication links can include logical (e.g., addresses) and physical (e.g., parameter format) information about the data exchange as discussed on specification page 2 beginning with line 6. The physical information or communication parameters are related to the standardized functional

description transmitted by the field device. This enables the data exchange not only with the field devices, but with their device functions or services.

Exemplary embodiments for integrating a new field device in an installation control system provides significant advantages. For example, detailed logic links and communication parameters need not be specified in a planning phase preceding realization of an installation, such as a switch gear assembly to be controlled by the field devices. In addition, installed functions of the control station and configured communication links between control station functions and field device functions can be associated to elements of the installation without manual intervention in a manner as described at specification page 5, paragraph 3.

The foregoing features and advantages are broadly encompassed by Appellants' independent claims 21 and 22. Claim 21 encompasses a method for integration of a field device in an installation control system, wherein the installation control system has a communications network and a control section. The claim 21 method comprises transmitting, by the field device, a functional description of its device functions to the control station in a standardized form. The claim 21 method also recites installing functions associated with the field device on the control station; and configuring communications links between the device functions and functions of the control station. Such a combination of features is neither taught nor suggested by the references relied upon by the Examiner.

VI. Grounds of Rejection to be Reviewed on Appeal

The final Office Action presents the following issues for a review on this appeal:

A. Whether claims 21 and 22 are anticipated by U.S. Patent No. 6,059,439 (Besnard);

B. Whether claims 4, 16, 21 and 22 are anticipated by U.S. Patent No. 6,298,377 (Hartikainen et al.);

C. Whether claims 5, 11, 21 and 22 are anticipated by U.S. Patent No. 6,618,745 (Christensen et al.);

D. Whether claims 5 and 11 are unpatentable over U.S. Patent 6,298,377 (Hartikainen et al.); in view of http://www.nettedautomation.com/standardization/IEC_TC57/WG10-12/iec61850/61850_on_a_page.html

E. Whether claims 2-9, 11 and 14-20 are unpatentable over U.S. Patent 5,960,214 (Sharpe, Jr. et al.);

F. Whether claims 9 and 20 are unpatentable over U.S. Patent 6,618,745 (Christensen et al.); and

G. Whether claims 2-9, 11 and 14-24 are unpatentable over U.S. Patent 6,615,088 (Myer et al.).

VII. Argument

Claims 21-22 are the sole independent claims pending. Independent claims 21-22 recite features neither taught nor suggested by any of the references relied upon by the Examiner. For example, none of the references relied upon by the Examiner are directed to integration of a field device in an installation control system. None of the references relied upon by the Examiner, considered individually or in combination, are therefore directed to the transmission, by a field device, of a functional description of its device functions to a control station as recited in claim 21. None of the references relied upon by the Examiner, considered alone or in combination, teach or suggest installing functions of a field device on a control station, or configuring communication links between device functions and functions of a control station.

The patents to Besnard, Hartikainen et al. and Christensen et al. are not directed to installation process, but are directed to operation of a configured system. Similarly, the Sharpe patent is directed to an organization of dataflow, and not to an installation process for integration of field devices into an installation system. The newly cited Myer et al. patent is not directed to industrial installations which involve field devices and communication links with field devices. As such, none of the patents relied upon by the Examiner teach or suggest features recited in independent claims 21 and 22.

The rejections based on the Besnard, Hartikainen et al., and Christensen et al. patents cannot stand because the patents fail to either expressly or inherently disclose a number of features recited in independent claims 21 and 22. Additionally, the dependent claims recite combinations of features defining combinations of separately patentable subject matter not disclosed in the patents. To anticipate the claimed invention, the cited references must disclose each and every feature set forth in the claimed combination of features (see, MPEP § 2131).

Various dependent claims are rejected throughout the final Office Action. For example, claims 5 and 11 were rejected under 35 U.S.C. §103 as being unpatentable over the Hartikainen et al. patent in numbered paragraph 10 of the final Office Action; in numbered paragraph 11, claims 2-9, 11 and 14-20 were rejected as unpatentable over the Sharpe, Jr. et al. patent; in numbered paragraph 12, claims 9 and 20 were rejected as being unpatentable over the Christensen et al. patent, and in numbered paragraph 13, dependent claims 2-9, 11, 14-20 and 23-24 were rejected, along with the independent claims, based on the Myer et al. patent.

The obviousness-based rejections based on the Hartikainen et al., Christensen et al., Sharpe, Jr. et al. and Myer et al. patents cannot stand because they fail to teach or suggest all features of claims 21 and 22. Additionally, the dependent claims recite combinations of features defining combinations of separately patentable subject matter not taught or suggested in the patents. To render obvious the claimed subject matter, the prior art reference must teach or suggest all the claim limitations (see, MPEP § 2143).

A. The Besnard Patent Does Not Disclose Each And Every Element Recited In The Claims.

The Besnard patent is not directed to a setup operation for integration of a field device in an installation control system. The Besnard patent is directed to acquisition of information from sensors in a building using a supervision unit. Acquisition of information is described, for example, at column 2, beginning line 44. The acquisition is performed by microprocessor 19 which is part of I/O device 12. Information is acquired during operation of the system by sensors 13. However, the

Besnard patent is not directed to a field device which transmits a functional description of its device functions to a control station in a standardized form. Besnard does not teach or suggest installation functions associated with the field device on a control station, or configuration of communications links between device functions and functions of the control station.

For at least these reasons, the Besnard patent does not disclose each and every element of claims 21 and 22. Accordingly, the rejection based on the Besnard patent should be reversed.

B. The Hartikainen et al. Patent Fails To Teach Or Suggest All Features Of Claims 21 and 22.

The Hartikainen et al. patent is not directed to a setup operation for integration of a field device in an installation control system.

The Hartikainen et al. patent is directed to a collection of data using intelligent devices via protocol-specific field communication interfaces. This patent is not directed to integration of a field device into an installation control system.

For at least these reasons, the Hartikainen et al. patent fails to teach or suggest each and every element of claims 21 and 22. Accordingly, the rejections based on the Hartikainen et al. patent should be reversed.

C. The Christensen et al. Patent Fails To Teach Or Suggest All Features Of Claims 21 and 22.

The Christensen et al. patent is not directed to a setup operation for integration of a field device in an installation control system.

The Christensen patent is directed to a communication gateway between smart devices and a controller as described at column 2, beginning with line 43. Again, the patent is directed to a discussion of normal system operation, as opposed to system setup. The system as disclosed is directed to coordinating communications of pre-connected devices using a connection manager 110. However, the patent does not teach or suggest integration of a field device, or installation of functions associated with a field device. In addition, this patent does

not teach or suggest transmitting a functional description of field device functions to a control station in a standardized form, but rather is directed to typical communications across a databus 30 as described at column 6, beginning with line 43.

The Christensen patent also fails to teach or suggest configuring communications links between field device functions and functions of a control station. This patent is merely directed to services, formats and behaviors used to build messages as described at column 6, lines 40-47 (as opposed to directing messages to a destination).

The Examiner responds to these points at page 2 of the Advisory Action:

> [The request for reconsideration] does NOT place the application in condition for allowance because: applicants' arguments (see pages 6-7) regarding USPN 6,618,745 B2 to Christensen et al. are not persuasive. The Christensen et al. reference does teach or suggest integration of a field device (see columns 14-15 lines 58-28) and installation of functions associated with a field device (see column 10 lines 40-52). The Christensen et al. reference also teaches or suggests configuring communication links between field device functions and functions of a control station (see columns 10-11 lines 64-8).

The Examiner asserts above that the Christensen et al. reference does teach or suggest integration of a field device. This assertion is traversed. The Christensen et al. patent is directed to an intelligent linking device as a communication gateway or bridge between smart field devices and a controller (col. 2 line 43). In particular, it enables communication links between, and control loops incorporating, function blocks of the field devices and function blocks that reside within the controller (col. 10, line 65). The Christensen et al. patent is directed to a method of operating the process control system. Thus, the "connection manager 110" coordinates the communication of the pre-connected devices, and thus is not a connecting manager serving to connect field devices. Accordingly, the Christensen et al. reference does not teach or suggest integration of a field device as claimed.

Further, as disclosed by the Christensen et al. patent, a linking device 28 stores a "live list" comprising all devices properly connected to the data bus (col. 15, lines 9-11). A live-list manager 122 of the linking device 28 recognizes new devices added to the bus by periodically sending probe node messages to addresses that are not on the live list (col. 15, lines 11-14). If a field device is present at a probed address, it returns a response message, subsequent to which the field device is added to the live list (col. 15, lines 18-22). Following this, the auto sense manager 112 of the linking device 28 may collect and produce "identification information" associated with the field devices and compare the latter with commissioning or configuration information stored in the memory 106 (col. 14, line 62 to col. 15, line 2). However, the Christensen et al. patent does not teach or suggest transmission of a functional description of the device functions in a standardized form as recited in claim 21, and as similarly recited in claim 22.

In contrast, the "identification information" as collected by the auto sense manager 112 of the Christensen et al. patent merely identifies whether the field device is a basic device or a bridge device (col. 14, lines 62-66). The Christensen et al. patent does not teach or suggest that this information pertains to a functional description of the device functions in a standardized form as recited in claim 21, and as similarly recited in claim 22.

The Examiner further asserts above that the Christensen et al. reference does teach or suggest installation of functions associated with a field device. This assertion is respectfully traversed. The Christensen et al. patent discloses the tasks of the linking device, such as generating diagnostic information, conveying identification information to a user terminal, and conveying "function block information" to the controller as needed (col. 10, lines 40-52). This "function block information" is published by and associated with the field devices (col. 12, lines 9-12) and comprises real-time information or measurement values of, e.g., the Analog Input function block 44. The plurality of functional blocks 100 of the linking device 28 cooperate to enable the linking of controller resident function block information, e g., the output of the PID function block 46 (col. 5, line 49), with function block information resident in one or more of the field devices 22-26 (col. 13, line 62).

However, the "function block information" according to Christensen is different from the "functional description" and the functions associated with field devices to be installed as claimed. The Christensen et al. patent does not teach or suggest configuring communications links between the device functions and functions of the control station, as recited in claim 21, and as similarly recited in claim 22.

The Examiner further asserts above that the Christensen et al. reference does teach or suggest configuring communication links between field device functions and functions of a control station. This assertion is traversed. The Christensen et al. patent discloses the linking device 28 itself enabling communication links between function blocks residing on the field devices and the controller, respectively, (col. 10, lines 63-66) to be exploited in control loops during operation (col. 11, lines 1-3). The communication stack 104 of linking device 28 allowing the functional blocks 100 to communicate along the protocol bus 30 with the field devices 22-26 is a "conventional Fieldbus communication stack" (col. 13, lines 23-26). Thus, those communication links are pre-established and operational. The Christensen et al. patent does not disclose or suggest when and how these communication links are pre-configured, i.e., prior to operation. Accordingly, the Christensen et al. patent does not teach or suggest configuring communication links between field device functions and functions of a control station as claimed.

For at least these reasons, the Christensen et al. patent fails to teach or suggest each and every element of claims 21 and 22. Accordingly, the rejections based on the Christensen et al. patent should be reversed.

D. The Sharpe, Jr. et al. Patent Fails To Teach Or Suggest All Features Of Claims 21 and 22.

The Sharpe, Jr. et al. patent is directed to a field device management system. However, this patent is merely directed to an organization of dataflow during normal operation, and not to the setup operation by which devices can be integrated into an installation system. As such, the Sharpe, Jr. et al. patent provides no teaching or suggestion for transmitting a functional description of field device functions to a control station upon integration of the field device into an installation control system.

In addition, the Sharpe, Jr. et al. patent provides no teaching or suggestion for configuring communication links between device functions of a field device to be integrated into an installation control system and functions of a control station.

The Sharpe, Jr. et al. system discloses a management system 10 in Figure 1, which is connected with a process 12 that includes smart field devices 16, 18, 20 and 22. Figure 2 illustrates the management system in greater detail as including a device server 68, a smart device communication interface 74 and a Device Description Server (DDS) 72 for interfacing with each smart device, such as smart device 12 in Figure 2. Referring to the Abstract of the Sharpe, Jr. et al. patent, the interface is described as providing communication for accessing information from and/or writing information to a smart field device, such as the smart field device 12. An object of the Sharpe, Jr. et al. patent is to avoid new programming when a new smart device is added, as discussed at column 5, line 2. However, the Sharpe, Jr. et al. patent provides no teaching or suggestion as to procedures to be implemented upon addition of a field device to an existing management system. Rather, the Sharpe, Jr. et al. patent is directed to the organization of dataflow in an existing management system, and is not directed to setting up the system.

In operation, the Sharpe, Jr. et al. system retrieves data from one of the on-line devices, such as smart device 12, in a manner as described at column 11, beginning with line 7. A command is sent to the smart device communication interface 74 of Figure 2, which sends a request to the DDS 72 for information on how to retrieve data and/or how to interpret the data. In response, "instruction information" for the data retrieval operation is obtained from the device description server and returned to the communication interface 74. The interface 74 uses this information to address the smart device 12. The smart device then responds with data streaming that includes the requested data.

The instruction information obtained from the device description server (DDS) 72 by the interface 74 appears to constitute logical and physical information behind the communications links, and it allows the server 68, via the communication interface 74, to access data from the smart device 12. Column 3, beginning with line 15 describes the DDS as a library of routines which can interpret the device

description of a smart device to provide information pertaining to the smart device such as: set up and configuration of the smart device; communication with the smart device; user interfaces; and methods for using conjunction with the smart device.

However, the Sharpe, Jr. et al. patent does not teach or suggest the manner by which the "instruction information" is supplied to the device description server. That is, there is no teaching or suggestion in the Sharpe, Jr. et al. patent for configuring communications links between device functions associated with the smart device, and functions of a control station. The final Office Action does not address these shortcomings of the system disclosed in the Sharpe patent.

The Examiner appears to correlate the claim feature of "configuring communications links" with the communication line 42 of Figure 1 in the Sharpe patent. However, the communication line 42 in the Shape, Jr. et al. patent is a physical line that connects the smart devices to a modem (see, for example, column 6, line 42 of the Sharpe, Jr. et al. patent). However, the mere indication of a physical communication line does not constitute a configuring of a communication link between device functions and functions of a control station, which is substantially more involved than merely providing the indication of the existence of a physical communication line.

In addition, the Sharpe, Jr. et al. patent does not teach or suggest the transmitting, by a field device, a functional description of its device functions to a control station. The Examiner appears to refer to "device related information" as representing the functional description recited in claim 1 (see, for example, the last paragraph on page 3 of the final Office Action). However, the information referred to by the Examiner can, according to the Sharpe, Jr. et al. patent, be provided either by the smart devices, or as described in column 6 beginning with line 27, can be stored in a database. Hence, the device related information cannot be considered to correspond to the functional description information which is necessarily transmitted by a field device upon integration of the field device into an installation.

Thus, the Sharpe, Jr. et al. patent fails to teach or suggest Appellants' method as recited in claim 21. Appellants' claim 22 is directed to an installation control system which contains structural elements for performing functions similar to those

described with respect to the claim 21 method. Thus, for reasons similar to those discussed above with respect to claim 21, claim 22 is also allowable over the Sharpe, Jr. et al. patent.

E. The Myer et al. Patent Fails To Teach Or Suggest All Features Of Claims 21 and 22.

The Myer et al. patent discloses a household system having master controller 36 which serves as a relay between appliances (such as a CD player, TV or microwave oven), and the Internet, as shown in Figure 2. The various appliances can include their own configuration files which are uploaded to the master controller 36 when the appliance is brought on line, as described at column 5, line 38. Instances, or objects 106-110, are instantiated to allow the master controller 36 to communicate with the appliances as described at column 5, line 40.

However, the appliances described in the Myer et al. patent are controlled via device drivers of the master controller 36 directly, and there are no field devices or communications links as recited in Appellants' independent claims 21 and 22. One skilled in the art would not have been motivated to modify the Myer et al. patent to include such features because this patent is not directed to an industrial installation which includes field devices between a control station and end devices (e.g., a high voltage switch gear assembly) which are also controlled by the field devices.

For at least these reasons, the Myer et al. patent fails to teach or suggest each and every element of claims 21 and 22. Accordingly, the rejections based on the Myer et al. patent should be reversed.

VIII. Claims Appendix

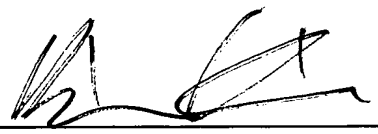
See attached Claims Appendix for a copy of the claims involved in the appeal.

IX. Conclusion

For the reasons discussed above, appellants respectfully submit that the Examiner's decision finally rejection claims 2-9, 11 and 14-24 should be reversed.

Respectfully submitted,

Burns, Doane, Swecker & Mathis, L.L.P.

Date December 20, 2004 By: 

Richard J. Kim
Registration No. 48,360

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

CLAIMS APPENDIX

The Appealed Claims

2. The method of claim 21 wherein before integration of the field device, the control station contains information about a structure of the installation.

3. The method of claim 21 wherein before integration of the field device, the control station contains information about an identity of the field device and/or about an identity of primary units which are associated with the field device.

4. The method of claim 21 wherein at least one function of the control station is installed automatically on the basis of the nature of this function.

5. The method of claim 21 wherein the functional descriptions of the field device use a description language in accordance with IEC Standard 61850-6 or its draft.

6. The method of claim 21 wherein generic functions of the control station associated with the field device are stored in the control station before a physical installation of the field device.

7. The method of claim 21 wherein functions of the control station that are associated with the field device are transmitted by the field device to the control station during a physical installation of the field device.

8. The method of claim 21 wherein generic functions of the control station that are associated with the field device are transmitted to the control station during physical installation of the field device using an address.

9. The method of claim 21, wherein the installation control system controls a high-voltage or medium-voltage switchgear assembly.

11. The installation control system of claim 22 wherein the device functions of the field device are described in a description language in accordance with IEC Standard 6 1850-6 or its draft.

14. The installation control system of claim 22 wherein the control station contains information about a structure of the installation before integration of any field device.

15. The installation control system of claim 22 wherein the control station contains information about an identity of the field device and/or about an identity of primary units which are associated with the field device before integration of the field device.

16. The installation control system of claim 22 wherein at least one function of the control station is installed automatically.

17. The installation control system of claim 22 wherein generic functions of the control station that are associated with the field device are stored in the control station before a physical installation of the field device.

18. The installation control system of claim 22 wherein functions of the control station that are associated with the field device are transmitted by the field device to the control station during a physical installation of the field device.

19. The installation control system of claim 22 wherein generic functions of the control station that are associated with the field device are transmitted to the control station during physical installation of the field device using an address.

20. The installation control system of claim 22, wherein the installation control system controls a high-voltage or medium-voltage switchgear assembly.

21. A method for integration of a field device in an installation control system, wherein the installation control system has a communications network and a control station, the method comprising:

a) transmitting, by the field device, a functional description of its device functions to the control station in a standardized form;

b) installing functions associated with the field device on the control station; and

c) configuring communications links between the device functions and functions of the control station.

22. An installation control system which has a control station and a communications network for communication with a field device, wherein the installation control system comprises:

a) means for receiving a standardized functional description of at least one device function of the field device;

b) means for installation of functions of the control station which are associated with the at least one device function of the field device; and

c) means for configuration of communications links between the at least one device function of the field device and the functions of the control station.

23. The method of claim 8, wherein the address is a URL (Uniform Resource Locator).

24. The method of claim 19, wherein the address is a URL (Uniform Resource Locator).

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None